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ABSTRACT

This executive summary of the 1986 Survey of Microcomputers in Higher Education presents the highlights of each of the major areas covered by the survey: (1) general policy; (2) microcomputer availability; (3) microcomputer access; (4) microcomputer acquisition; (5) software availability; and (6) software support. The 211 survey respondents were drawn from the membership of EDUCOM and represent 103 public and 108 private institutions. Results of analyses of the data from the survey, which are summarized in 15 figures, suggest that institutions of higher education are gearing up for the widespread use of microcomputers on campuses. Recommendations for higher education and for hardware and software developers and vendors conclude this report. (RP)

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Microcomputer use in higher education

Executive summary
of a survey conducted
by EDUCOM and
Peat Marwick in
cooperation with
*The Chronicle of
Higher Education*

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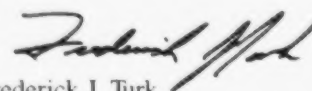
Microcomputers in Higher Education: A Survey of Those Directly Involved

Peat Marwick is pleased to present a report on the 1986 Survey of Microcomputers in Higher Education, undertaken by EDUCOM and Peat Marwick, in cooperation with the Chronicle of Higher Education. The survey, part of the EDUCOM Software Initiative, provides one of the first sets of systematically collected data on microcomputer acquisition and use on college and university campuses.

This executive summary offers highlights of each of the major areas of the survey—General Policy, Microcomputer Availability, Microcomputer Access, Microcomputer Acquisition, Software Availability, Software Acquisition, and Software Support. The information and ratios included in the executive summary present the major findings. A more detailed treatise is available in the full report.

The data have been analyzed by a variety of attributes, including institution control, enrollment size, and selectivity. These data were combined to produce such ratios as students to microcomputers and weekly hours of access per student. The results are presented graphically and supplemented, in the full report, with tabulations of counts and percentages for responses to each question.

The report is the result of the efforts of a number of people, especially the principal author and analyst, Dr. Susan S. Lukesh, Peat Marwick senior consultant; Steven Gilbert, director of the EDUCOM Software Initiative; and Robin Ross, associate publisher of *The Chronicle of Higher Education*. Thanks are also due to Brian Kahin, research affiliate at the Massachusetts Institute of Technology, and Casey Green, senior research associate at The University of California at Los Angeles, who assisted in drafting the survey instrument, numerous EDUCOM board members and institutional representatives, and Peat Marwick partners and staff who participated in the survey effort. To Pat Copper and Bill Naftel, also of Peat Marwick, we owe thanks for working tirelessly to ensure clear data, a principal component of valid analysis. And finally to Barbara Ryan of Editorial Associates and Karen Schimpf of Peat Marwick—we appreciate their support in editing and publishing this report.



Frederick J. Turk
National Director for Services
to Higher Education

Peat Marwick

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Order Form and Envelope

Introduction

This summary reports the highlights of a survey on microcomputer usage in institutions of higher education. Undertaken by Peat Marwick and EDUCOM, in cooperation with *The Chronicle of Higher Education*, the survey represents a first step in coordinated efforts to improve software resources in higher education.

Background

It is common knowledge that microcomputers are proliferating on college and university campuses across the country. However, our understanding of this proliferation and of the integration of microcomputers into the curriculum is hazy.

Inspired by the success of particular software applications and development projects, the member institutions of EDUCOM have expressed concern about a range of software issues. Although many of the problems may be resolved over time, an acute sense that colleges and universities—even individual departments—are laboring in isolation, wastefully duplicating efforts, and suffering from artificially high costs and inadequate information.

EDUCOM, a Princeton-based consortium of 450 institutions of higher education with more than 60 corporate associates, has responded to its members' concerns by undertaking a project called the "EDUCOM Software Initiative." The project aims at identifying and overcoming the barriers to effective use of software in higher education. This survey is part of the project.

Purpose of the Survey

Conducted in August 1986, the survey was intended to fill the gap in knowledge about the prevalence of microcomputers on college and university campuses. The findings provide valuable baseline data and will also be used in other phases of the "Software Initiative" as part of the effort to analyze current needs and demand for computer software in higher education.

It is anticipated that subsequent surveys will expand on aspects of the demand for software while continuing to ascertain the usage of microcomputers. Such surveys will yield data on trends, currently lacking in the literature.

Profile of Respondents

The survey population was drawn from the membership of EDUCOM. This sample, though not intended to be representative of all institutions of higher education, closely represents those

institutions in the forefront of concern about computing and resources for computers. The 211 respondents were distributed fairly evenly between public (103) and private (108) institutions. The majority (60 percent) represented universities; the balance represented four-year colleges (30 percent), two-year colleges (8 percent), and institutions offering only professional or graduate degrees (2 percent).

The data were tabulated not only by type of institution but also by size of enrollment, region, and degree of competitiveness in admissions (the latter measure derived from Barron's *Selector**). The full report shows these breakdowns, as appropriate.

*The *Selector* is a categorization of colleges into six groups—most competitive, highly competitive, very competitive, competitive, less competitive, and noncompetitive—based on a combination of entering students' high school rank and grade averages, and their entrance examination, SAT, and ACT scores. *Profile of American Colleges, Index of College Majors* (Barron's Educational Series, Inc., 1984), pp. viii-xv.

Fig. 1
*Institutional Requirements/
Recommendations:
Microcomputer Ownership*

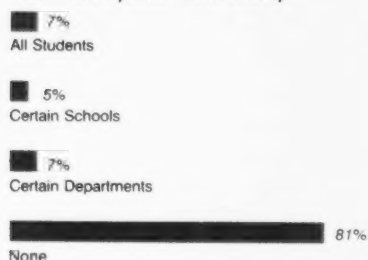


Fig. 2A
Estimated Student Ownership

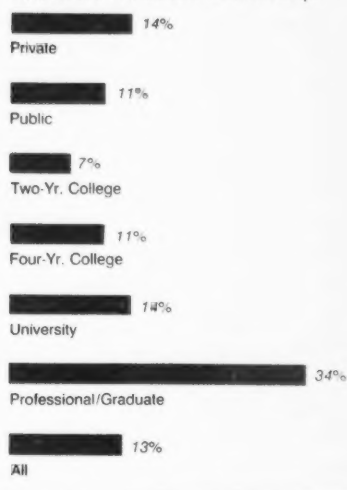
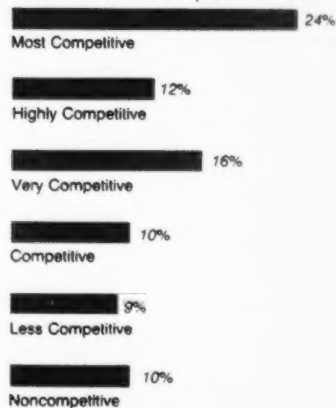


Fig. 2B
*Estimated Student Ownership by
Admissions Competitiveness*



Highlights of the Findings

Student Ownership of Microcomputers

Less than one-fifth of the institutions of higher education surveyed required or strongly recommended that students own microcomputers. As Figure 1 shows, more than 80 percent indicated that they neither required nor recommended personal ownership. The remainder split evenly: In some schools the requirement/recommendation was made of all students; in others it was made only of students in certain schools or certain departments.

An estimated 13 percent of students in the institutions surveyed owned microcomputers (Figures 2A and 2B). Not surprisingly, the more complex the institution, the higher the estimated ownership—the estimate was higher for students in universities than in four-year or two-year institutions. Similarly, the estimate was higher for students in the more competitive institutions—the more competitive the institution, the more likely a student was to own a microcomputer.

Student and Faculty Access to Microcomputers

Three measures of access to microcomputers were developed from the survey data. For the first measure, estimates of the number of institutional microcomputers available to students and faculty were combined with enrollment figures to produce

estimates of the numbers of students and faculty for each institutionally owned microcomputer. At the responding institutions, there were 17 students and faculty for each institutionally owned microcomputer.

For the second measure, estimates of the numbers of students and faculty who personally owned microcomputers were included with estimates of institutional ownership to calculate the number of students and faculty for each microcomputer. With this measure, the number drops to 5 students and faculty for each microcomputer, demonstrating the significance of personal ownership in any assessment of the demand for machine access (Figure 3).

Fig. 3
*Number of Students and Faculty
to Each Microcomputer*

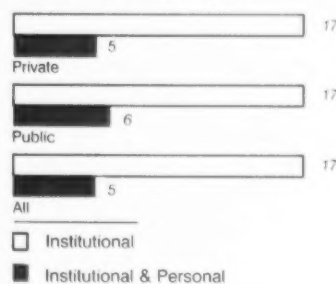
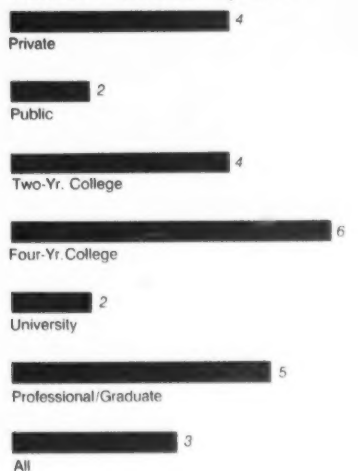


Fig. 4
Average Weekly Hours of Access to Microcomputers



For the third measure, the number of microcomputers available in central facilities was combined with weekly hours of access and with the numbers of students and faculty to calculate the average weekly hours of access each student and faculty member had. Because this measure includes only central facilities and excludes departmental microcomputers and personal ownership, it must be seen as a "worst case" of the average hours of access. The average overall access of students and faculty to institutionally owned microcomputers in central facilities, as shown in Figure 4, was 3 hours per week.

The differences in hours of access between public and private institutions and between universities and four-year colleges are striking (Figure 4). Do private institutions attach more importance to providing access to institutionally owned microcomputers than do public institutions? Or is the difference due to funding? Similarly, why do four-year institutions appear to provide four times as much access to institutionally owned microcomputers than as universities provide? Future surveys will perhaps reveal the sources of these differences.

Institutional Ownership of Microcomputers

Respondents were asked to estimate the percentage of institutionally owned microcomputers by brand name/model (a list of major brands/models was supplied). The estimates show a core of favorites (see Figure 5).

Fig. 5
Ownership by Brands/Models: Average Estimated Percentage

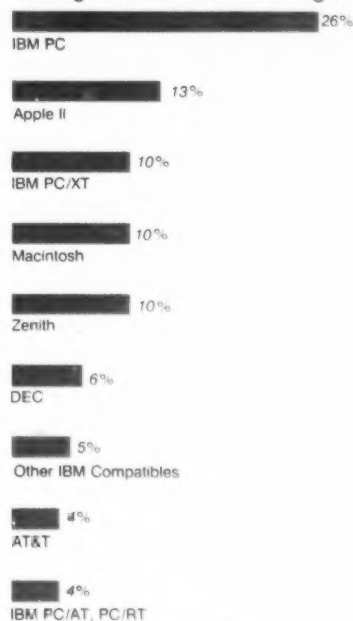


Fig. 6
Ownership by Brands/Models:
Average Numbers

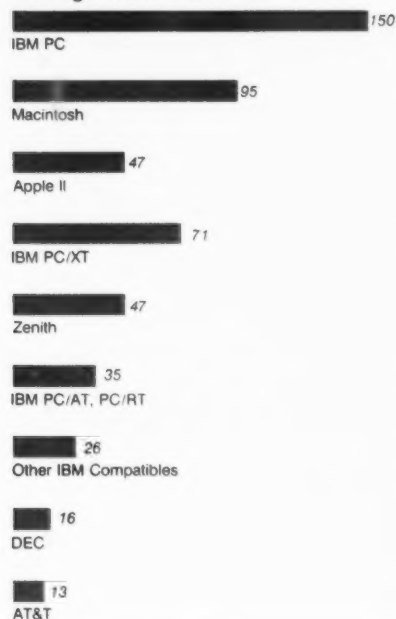
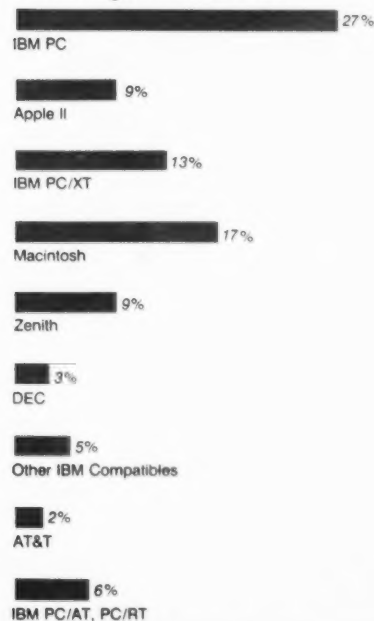


Fig. 7
Ownership by Brands/Models:
Percentage in Entire Pool



These percentage estimates were combined with estimates of the numbers of institutionally owned microcomputers to produce the number of machines available by type. As Figure 6 shows, the number of machines by brand name/model changes the rank order of institutional holdings. The percentage of the total number of machines by brand name/type is shown in Figure 7.

Acquisition of Microcomputer Software

The strategy for acquiring microcomputer software in higher education institutions includes obtaining site licenses as well as volume discounts (Figure 8).

- More than 60 percent of the respondents indicated that they had negotiated or were currently negotiating for site licenses.
- 65 percent of the respondents indicated that they had negotiated for volume discounts; not surprisingly, the larger the institution, the more likely it was to have negotiated for these discounts.
- More than half (56 percent) of the respondents indicated that software was sold on their campuses or at campus-affiliated outlets. Of these respondents, half indicated that the software was sold at better than generally advertised discount prices.

Availability of Microcomputer Software

More than 60 percent of the institutions surveyed had a central pool of microcomputer software for borrowing. Private institutions were more likely to have this pool than public institutions. Distribution of microcomputer software is still rare in library

Fig. 8
Institutional Activities to
Acquire Software

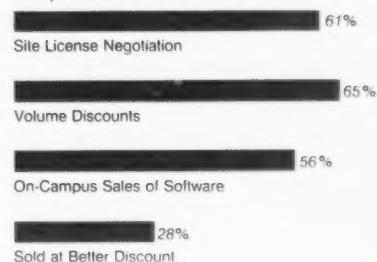


Fig. 9
*Institutional Availability of Software:
Microcomputer vs.
Non-microcomputer*

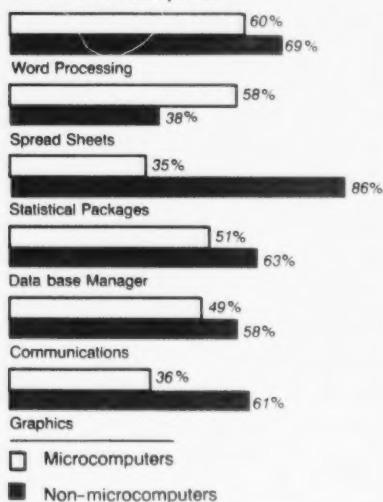
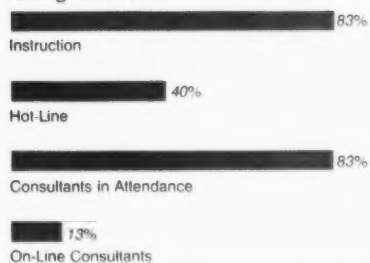


Fig. 10
*Institutional Assistance in
Using Software*



facilities; only 20 percent of the respondents estimated that library staff were distributing software.

Nearly all the central software pools offered word processing and spread sheets, whereas courseware was least likely to be available (less than one-third offered it). Figure 9 compares central pool availability of types of software for microcomputers with that for non-microcomputers (minicomputers or mainframes) —a comparison that may indicate the possibilities of expanded software development for microcomputers.

Assistance in Using Microcomputer Software

To derive the fullest benefits from the products, students, faculty, and staff may need assistance in using microcomputers.

Ninety percent of all respondents indicated that their institutions offered assistance, most commonly in the form of instruction or consultants in attendance (Figure 10).

Respondents were asked whether their institutions had formal plans or projects for integrating microcomputers into the curriculum and whether they provided assistance for using microcomputers for instructional purposes. As Figure 11 shows, three-quarters of the responding institutions indicated that they offered assistance in using microcomputers for instruction. The most common types of assistance offered were evaluation

of software and technical assistance in equipment operation; least common were assistance in integrating student computer use with general instructional objectives and training in specialized software (Figure 12). Far more institutions offered assistance in instructional uses of microcomputers than had formal plans and projects for integrating microcomputers into instruction. This suggests that the integration of microcomputers into the curriculum is still in its infancy.

Fig. 11
*Integration of Microcomputers
into the Curriculum*

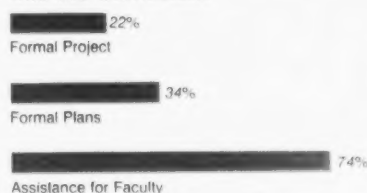


Fig. 12
*Institutional Assistance to
Faculty in Using Computers
for Instructional Purposes*

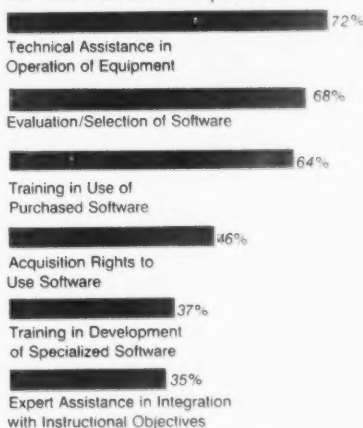


Fig. 13
Institutional Policy Concerning
Access and Duplication

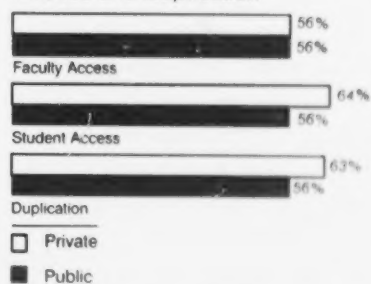
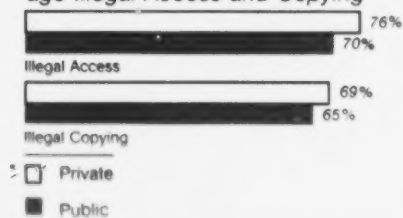


Fig. 14
Institutional Procedures to Discourage
Illegal Access and Copying



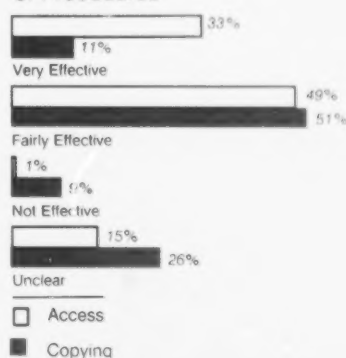
Policy and Procedures: Illegal Access and Duplication

Microcomputer software is more readily transportable and is more often a target for copying than software offered on traditional mainframes and minicomputers. Written policy covering access to and use of software is a critical step in assuring proper and legal use.

- More than half the responding institutions indicated that they had written policies covering faculty and student access and duplication, as well as privacy. Private institutions were slightly more likely to have these policies than were public institutions (Figure 13).
- More than 70 percent of the responding institutions had established procedures to discourage or impede illegal access to software, and 65 percent had procedures to discourage or impede illegal copying (Figure 14). Again, private institutions were more likely than public ones to have adopted these procedures.

Among respondents from institutions with procedures in place, 33 percent thought those procedures were very effective against illegal access, and 11 percent thought them very effective against illegal copying (Figure 15).

Fig. 15
Rating of Effectiveness
of Procedures



Conclusions and Recommendations

The findings of this survey clearly demonstrate that institutions of higher education are gearing up for the widespread use of microcomputers on campuses. Not only have institutions made facilities available for using microcomputers and for distributing software to the academic community, but many students and even larger proportions of faculty and staff—as the full survey findings show—already own microcomputers. In addition, more than half the institutions have some sort of requirement—either for all students or for those in certain schools or departments—that students take an introductory course in computing before graduation. Moreover, the full findings of this survey demonstrate the strength of the correlation between microcomputer availability, access, and support on one hand, and an institution's degree of competitiveness on the other. This, in turn, highlights the fundamental importance of microcomputers in the academic programs themselves. The survey thus points to an era in which computer knowledge, and the microcomputer, will be a standard part of the higher education experience.

Challenge to Institutions of Higher Education

Computing is a major component of any strategic plan in higher education today. Not only will hardware, software, and personnel resources have to be taken into account, but so also will the direction of computing and the level of support required to fulfill the institution's mission. College and university administrators will find this survey invaluable in the development and refinement of a specific plan for computing.

This summary has only touched on the major findings of the survey. The full report provides information on access policies and procedures, on availability and acquisition of both hardware and software, and, most importantly, on the fundamental integration of microcomputers into the curriculum. The details—showing findings by institutional control, type, enrollment size, and admissions competitiveness—will help planners determine their own institution's goals for microcomputer usage in light of their resources and missions. Institutions will also be able to assess whether they are keeping pace with similar institutions in developing microcomputer resources.

Challenge to Hardware and Software Developers and Vendors

The survey's detailed findings show the status and penetration of the higher education market.

They also reveal that most institutions have not yet integrated microcomputer software into the curriculum. Software for instruction is lagging behind software for word processing and spread sheets. Nonetheless, the stage appears to be set for realizing this potential. As the survey shows, institutions are routinely providing access to microcomputers and supporting hardware and software use. Some are even providing support for the development of instructional software—a few forward-looking ones with written policies. Moreover, a majority of institutions have enacted policies and procedures to counter the problems of illegal access and copying of software. The challenge ahead for hardware and software developers and vendors will be to design and ensure the availability of machines and software that can meet instructional needs—in other words, that can respond to one of the key missions of the institutions.

The computing environment in higher education today is clearly a moving target. College and university administrators, as well as hardware and software developers, will need to pay close attention to the developing trends. Only in this way can they best serve their respective constituents and markets.

The complete survey report presents more detail and analysis of the findings broken down by such characteristics as type of institution, private or public control, size of enrollment, degree of competitiveness, and region of the country. With graphs, other illustrations, and tables showing the numbers and percentages for all questions, the full report provides the first in-depth look at the access to, and use of, microcomputers on college and university campuses today.

Please use the tear-off form at right to order your copy(ies) of the survey report.

If you have any questions about the survey, please direct them to Dr. Susan S. Lukesh, Peat Marwick, 345 Park Avenue, New York, New York, 10154 212-872-6836.

Microcomputer Use in Higher Education 1986 Survey

Order Form

Prices for the survey report (one category only):

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